

The Department for Education

External School Review

Partnerships, Schools and Preschools division

Report for Australian Science and Mathematics School

Conducted in October 2018



Review details

A priority for the Department for Education is to improve the educational attainment and wellbeing of South Australia’s children and young people.

The purpose of the External School Review is to support schools to raise achievement, sustain high performance and to provide quality assurance to build and sustain public confidence in government schools.

The external school review framework underpinning the review identifies the key levers for school improvement and has been shaped and informed by research.

The overarching review question is “how well does this school improve student achievement, growth, challenge, engagement and equity?”

This report outlines aspects of the school’s performance verified through the review process according to the framework. It does not document every aspect of the school’s processes, programs and outcomes.

We acknowledge the support and cooperation provided by the staff and school community. While, not all review processes, artefacts and comments are documented, they all have been considered and contributed to the development and directions of this report.

This review was conducted by Rob McLaren, Review Officer, Review, Improvement and Accountability directorate and Ngaire Benfell, Review Principal.

School context

The Australian Science and Mathematics School opened in 2003 and caters for students from year 10 to 12. Students are invited to apply, outlining their interests in mathematics and science, career pathways and approaches to teaching and learning. It is situated 13kms south of the Adelaide CBD, and is part of the Marion Inland Partnership. Enrolment in 2017 was 370 students, with 30 of these being international students, and enrolment is currently 386 students. FLO enrolments in 2017 were 1, with 3 in 2018.

The school is classified as Category 6 on the department's Index of Educational Disadvantage. The school's ICSEA score in 2016 was 1078.

The school population includes 1% of Aboriginal students, 2% of students with disabilities, 16% of families eligible for School Card assistance, 28% of students of non-English speaking background, and 1 young person in care.

The school leadership team consists of a principal in their 2nd year of tenure at the school, a deputy principal, 3 senior leaders: 1 Band 4 and 2 Band 3, 4 Band 2 leaders, a business manager, ICT manager and 12 coordinators. There are 41 teachers, including 12 in the early years of their career and 14 school services officers.

Lines of inquiry

In considering the data summary in the school performance overview (Appendix 2) and the principal's presentation, the review panel explored the following lines of inquiry to evaluate the school's effectiveness towards raising student achievement and sustaining high performance.

During the external review process, the panel focused on 3 key areas from the External School Review framework:

Student Learning: **How effectively is student learning growth monitored, evaluated and supported?**

To what extent are students engaged and intellectually challenged in their learning?

Effective Teaching: **How effectively are teachers supporting students to become self-directed in their learning?**

School Community Partnerships: **How effective is the school in developing educational partnerships in learning with the wider community to enhance and connect the learning in meaningful ways?**

How effectively is student learning growth monitored, evaluated and supported?

To what extent are students engaged and intellectually challenged in their learning?

Part of the school's role is to act as an agent to foster improvements, innovation and reform in science and mathematics education. It develops new approaches to teaching and learning through the creation of an environment and interaction with professional scientists and mathematicians within institutions and industry.

In the principal's/leaders' presentation the panel was made aware of the unique interdisciplinary approach to learning through the central studies (CS) program in which students attempt 3 interactive central studies each semester over 2 years. Woven through these studies are the general capacities of literacy, numeracy, ICT, critical and creative thinking, personal and social development, and ethical and intercultural understanding, which provides a balance and connectedness to real world skills. The learning studies (LS) program, where students are vertically grouped (years 10, 11, 12), meet daily, providing consistency of support with the same LS teacher and group over 3 years. Students develop skills in being effective learners and active citizens through this program. Students construct an e-portfolio of learning, develop learning skills in self-direction and effective learning, while providing opportunity for the completion of some compulsory SACE units such as PLP, Health and Physical Education.

Through conversations with staff and students, it was clear that this program was central to supporting the learner. Student progress in learning was evaluated through the reflective work in students constructing their e-portfolio, presentation of learning conversations in terms 1 and 3 and the completion of graduate capabilities. Students commented positively about the LS program, as it provides peer support in vertical groups, and has focused support for the completion of SACE. LS teaching teams meet regularly to monitor and evaluate student learning data, and are also supported by feedback from CS teachers. From this group, or individual LS or CS teachers, referrals are made for learning support. Leaders said data is gaining importance and use, especially when trying to determine student learning growth, and drives conversation between teachers and students through learning conversations and the e-portfolio.

There was a developing investigation by staff, around processes and valid data measures, for the measurement of learning growth, using general capabilities. It was stated the LS program and its teams provide the necessary 'glue', which 'binds' the elements mentioned above together. Staff, and to some degree students and parents, were using a common language around general capabilities to articulate learning and learning growth. Evidence was provided of the use of general capabilities in learning reflections, learning conversations, e-portfolio learning artefacts, developments in learning plans and assessment tasks, and initial attempts at tracking and monitoring of student growth. The exploration of processes to track and monitor learning growth is in its early stages, and the panel noticed a variance in understanding of staff about what data to refer to for learner growth, but there was a willingness to explore solutions. Conversations with the school's partner, Flinders University, confirmed strong support for the development of a capabilities-based assessment.

The school's development plan priorities have provided clear direction in progressing the thinking about what is "growth in learning". Using capabilities to describe elements of this growth in learning has been established and is evident in staff, students and, to some degree, the parents' language. Capabilities form a growing part of learning plans, learning and assessment tasks and portfolios of work. This work needs to be further developed through building staff capacity and agreement on how to effectively monitor and evaluate student growth to better inform learner and teacher practice.

Priorities of the school's development plan and elements of the principal's/leaders' presentation to the panel focused on engagement driven by the development of self-directed learners, learner agency, co-construction of learning and challenge, effective learning environments, teaching approaches, learning programs and the school organisation that connects learning to real life.

Development of self-directed learners was a feature of many presentations during the external school review visit. The year 10 semester 1 learning studies program illustrated to the panel how LS teachers carefully nurture and unpack what it is to be a self-directed learner, and the support available to students to refine their control of their learning. Pairing year 10 CS classes with year 11 students provides peer support structures towards skills in time management, freedom of choice, and 'checking-in' with teachers

to review progress. Observations of classes, cited unit plans and tasks also showed features that gave greater control to the learner in exploring their learning.

At the end of a unit, students are able, and often invited, to provide feedback on unit design, and how they believed units of work could be improved. This feedback is provided to writing teams in their process of reflection, and forms an important part of self-review and future development of learning plans and resources. Learner agency and co-construction of learning is developing, but is more prevalent in learning that has fewer restrictions around the assessment and curriculum criteria. These learning programs, together with the student research unit, the child protection curriculum, Adventure Space, and Project Toad are spoken of very positively by students. Staff commented that, while only in its infancy, they are very keen to further develop both student agency and co-construction of learning.

Challenge is supported in classrooms by an inquiry approach to learning using big ideas. Unit plans and assessment tasks posed questions and provocations to students to explore learning concepts. Classroom observations and conversations with students confirmed students taking greater control of how they learn and seek support when needed. Confident students continued on with their inquiry, supported along the way by teacher check-ins where students get feedback about next steps. Students needing extra help, or more directed guidance, were provided with opportunities to take part in tutorial-type sessions during class, where concepts were explained in more detail and discussed. To support this further, unit resources and tasks are provided online through the school's learner management system which students can access at any time to complete and submit work.

Staff and students see challenge in the way in which learning is constructed around an inquiry approach, and a focus in developing independent learners. High expectations and a culture of success also play a vital role in providing the necessary culture for challenge to exist. Opportunities exist to build teacher capacity by developing clarity of understanding and agreement of what 'student agency' is and how it would enhance independent learners.

This could be further supported by supporting staff to build their capacity to effectively facilitate co-construction of learning with students.

Direction 1

Develop agreements on how to effectively monitor and evaluate student growth to better inform learner and teacher practice.

How effectively are teachers supporting students to become self-directed in their learning?

A cornerstone in the school's vision of developing 'extraordinary learning driven by curiosity and challenge, inspiring passion and confidence', is the development of more independent self-directed learners through an inquiry approach to learning. Structures, organisation, teaching approaches and programs at the school support this development.

Learning studies program, with its vertical student grouping and focus on supporting learning, in particular self-directed learning, is seen as central and connected to all programs offered by the school. Leaders and teachers described how the central studies program in its organisation and delivery demanded students' skills in self-direction, evidenced through students being expected to take control of how they learn and where they learn, using learning spaces and resources. Students spoke very positively about managing their learning, with support from their teachers through check-ins and arranged tutorial sessions. Cited teaching programs and assessment tasks showed in their design a release-of-control in

learning from teacher to learner. Resources for learning, uploaded onto the learner management system, are reviewed and quality controlled to provide consistency of presentation, clarity of learning intentions, success criteria, scaffolding of learning and challenge.

Learning conversations between teachers and students are viewed by students as extremely important in supporting them to be more self-directed. Additionally, feedback provided by teachers, verbally or online, was seen as very helpful. Students commended the different ways teachers provide timely and useful feedback to them.

The school has established many highly effective structures, processes and practices that support self-directed learners. To further enhance students in these skills, the development of agreements between staff about what is effective student agency in learning and how students and staff can co-construct learning to strengthen students' capacity to take greater control of their learning, will be helpful. Once agreements are achieved about what is effective student agency and co-construction in learning, the building of student and teacher capacity to engage in this would be required.

Direction 2

Develop agreement about what is effective student agency and co-construction of learning and build student and teacher capacity to further support the development of self-directed learners.

How effective is the school in developing educational partnerships in learning with the wider community to enhance and connect the learning in meaningful ways?

As stated in the development plan 2018-20: 'partnerships enrich student learning', providing opportunities for the school to access specialised local and global expertise and experience, evident in learning programs. In conversations with leaders and partnership groups the panel was made aware of a number of 'partnerships in learning' that exist to provide added value and learning opportunities.

Partnerships exist with Flinders University, other universities, Flinders Medical Centre, Department for Education, Tonsley Innovation Centre, and other public schools. The school is also a lead STEM school, providing leadership and support for STEM learning to associate schools and the system. Each of these partnerships provides authenticity to the learning opportunities within the school.

Leaders mentioned considerable anecdotal evidence suggesting that established partnerships were providing great support for learners, and developing within the system of education a greater understanding of science and mathematics education. Leaders, teachers and students commented positively on experiences where the partnership in learning enhanced the learning experience, not only in its real world connection, but also in the way it enhanced important aspects of learning around the general capabilities.

Existing partnerships have provided opportunities for students and programs to connect learning with real-world situations, which have enriched the students' engagement and motivation. To further develop and enhance an interdisciplinary approach to learning and support of self-directed learners, the panel believe it is important to review and evaluate the existing successful partnerships and clarify what makes them valuable to learning. This will provide criteria and possible direction for further partnership development in the support of the school's priorities, and an interdisciplinary approach to learning, that is both reciprocal in value and sustainable.

Direction 3

Review and evaluate existing partnerships in learning as a first step in the development of plans and agreements for ongoing partnership development, which support the interdisciplinary approach of the school, have reciprocal value and are sustainable.

What is the school doing particularly well and why is this effective?

During the review process, the panel verified the following effective practices that are contributing significantly to school improvement at the Australian Science and Mathematics School.

Effective practice in developing student learning growth was evident at the school. Ongoing investigations and development of systems and processes by PLCs attempting to articulate, track and monitor student learning growth in relation to general capabilities and other datasets, has been influenced by an evidence-based approach leading to an improved understanding of learning growth pertaining to the general capabilities.

Effective practice in developing student learning, in terms self-directed learners, is promoting engagement and challenge within learning. Strategic planning and resourcing learning environments, teaching approaches, learning programs, school organisation and ongoing refinement of greater student agency in learning, have supported the skill development of this type of learner.

Outcomes of the External School Review 2018

The Australian Science and Mathematics School has shown that effective leadership provides strategic direction, planning and targeted interventions. Teachers are supported with and effectively use structured time for ongoing collaborative professional learning.

The principal will work with the education director to implement the following directions:

1. Develop agreements on how to effectively monitor and evaluate student growth to better inform learner and teacher practice.
2. Develop agreement about what is effective student agency and co-construction of learning and build student and teacher capacity to further support the development of self-directed learners.
3. Review and evaluate existing partnerships in learning as a first step in the development of plans and agreements for ongoing partnership development, which support the interdisciplinary approach of the school, have reciprocal value and are sustainable.

Based on the school's current performance, Australian Science and Mathematics School will be externally reviewed again in 2021.



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Appendix 1

Attendance policy compliance

Implementation of the Education Department student attendance policy was checked specifically against documented evidence. The school was found to be compliant with this policy.

The school attendance rate for 2017 was 90%.

Appendix 2

School performance overview

The external school review process includes an analysis of school performance as measured against the Department for Education Standard of Educational Achievement (SEA).

Reading

The Australian Science and Mathematics School caters for students from years 10 to 12 hence there is no NAPLAN data available.

The school makes use of PATR data. In 2017 84% of year 10 students and 81% of year 11 students achieved SEA.

Numeracy

The Australian Science and Mathematics School caters for students from years 10 to 12 hence there is no NAPLAN data available.

The school makes use of PATM data. In 2017 83% of year 10 students and 83% of year 11 students achieved SEA.

SACE

In terms of SACE completion in 2017, 81% of students enrolled in February and 97% of those enrolled in October, who had the potential to complete their SACE, did go on to successfully achieve their SACE. The results represent an improvement from the historic baseline average.

For compulsory SACE Stage 1 and 2 subjects in 2017; 100 % of students successfully completed their Stage 1 Personal Learning Plan, 98% of students successfully completed their Stage 1 literacy units, 97% successfully completed their Stage 1 numeracy units and 100% successfully completed their Stage 2 Research Project.

Ninety four percent of grades achieved in the 2017 SACE Stage 2 were C- or higher. This result represents an improvement from the historic baseline average. One percent of students completed SACE using VET and there was 1 student enrolled in the Flexible Learning Options program in 2017.

For attempted Stage 2 SACE subjects in 2017, 16% of students achieved an 'A' grade, and 47% achieved a 'B' grade. This result represents a decline for the 'A' grade and an improvement for the 'B' grade from the historic baseline averages.

In terms of 2017 tertiary entrance, 96%, or 100 out of 104 potential students achieved an ATAR or TAFE SA selection score. There were also 12 students who were successful at achieving a merit.